(19) World Intellectual Property Organization International Bureau



(43) International Publication Date 3 April 2003 (03.04.2003)

PCT

(10) International Publication Number WO 03/027431 A 3

(51) International Patent Classification⁷: C09K 3/00

E21B 43/26,

WO 03/027431 A3

(21) International Application Number: PCT/US02/30202

(22) International Filing Date: 24 September 2002 (24.09.2002)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/325,071 60/340,224 26 September 2001 (26.09.2001) US 7 December 2001 (07.12.2001) US

(71) Applicant and

(72) Inventor: COOKE, Claude, E., Jr. [US/US]; 197 Lake View Circle, Montgomery, TX 77356 (US).

(74) Agent: COOKE, Claude, E., Jr.; Baker Botts L.L.P., 910 Louisiana Street, One Shell Plaza, Houston, TX 77002 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR).

Declaration under Rule 4.17:

as to the identity of the inventor (Rule 4.17(i)) for all designations

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report:
 19 June 2003

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND MATERIALS FOR HYDRAULIC FRACTURING OF WELLS

(57) Abstract: Hydraulic fracturing of wells by injecting a degradable polymer phase as a fracturing fluid is provided. Composition and degree of polymerization of the degradable polymer and the selection of additives may be varied to adjust the viscosity, degradation time and other properties of the fracturing fluid. Viscous degradable fluid or pellets of degradable polymer may be placed in a wellbore as an internal phase in a low viscosity carrier fluid. A polymer-continuous liquid phase may be formed at a selected location in the wellbore, usually near perforations, before the polymer phase is pressured into a formation to form a hydraulic fracture.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/30202

		PC1703023020	
A. CLASSIFICATION OF SUBJECT MATTER			
IPC(7) : E21B 43/26; C09K 3/00			
US CL : 166/308; 507/209, 219, 221, 922, 924			
According to International Patent Classification (IPC) or to both national classification and IPC			
B. FIELDS SEARCHED			
Minimum documentation searched (classification system followed by classification symbols)			
U.S.: 166/308; 507/209, 219, 221, 922, 924			
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched			
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)			
EAST			
C. DOC	UMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where a	appropriate, of the relevant passages	Relevant to claim No.
X	US 5,699,860 A (GRUNDMANN) 23 December 19		24, 25, 30-32
^	column 4, lines 22-27.	or (20.12.1997), Example 1 and	14, 25, 50 52
v	•	9 09 1005) rolumn 6 1ines 20 45	1 2 4 5 7 0 11 16
X	US 5,439,059 A (HARRIS et al) 08 August 1995 (0	6.06.1993), column 6, lines 39-43.	1, 2, 4, 5, 7, 9, 11, 16,
	17, 21-23		
X	US 4, 417, 989 A (HUNTER) 29 November 1983 (29.11.1983), column 6, lines 36-47.		
Α	US 4,715,967 A (BELLIS et al) 29 December 1987 (29.12.1987) see claims.		· 1-23
		{	
1			
			i
		i	
Further	documents are listed in the continuation of Box C.	See patent family annex.	į
- 5	pecial categories of cited documents:	date and not in conflict with the applic	
"A" document	defining the general state of the art which is not considered to be	principle or theory underlying the inve	
	lar relevance		
		"X" document o. particular relevance; the o	
"E" earlier app	ofication or patent published on or after the international filing date	considered novel or cannot be consider when the document is taken alone	ed to involve an inventive step
"L" document	which may throw doubts on priority claim(s) or which is cited to	when the document is taken stone	
	he publication date of another citation or other special reason (as	"Y" document of particular relevance; the o	laimed invention cannot be
specified)		considered to involve an inventive step	
0 4		combined with one or more other such	
"O" document referring to an oral disclosure, use, exhibition or other means being obvious to a person skilled in the an			an
"P" document published prior to the international filing date but later than the "&"		"&" document member of the same patent f	amily
priority date claimed			
Date of the actual completion of the international search Date of mailing of the international search report			
10 March 2003 (10.03.2003) 07 APR			
Name and mailing address of the ISA/US Authorized officer			
Commissioner of Patents and Trademarks			
Box PCT Philadelian Philadelia		Philip C Tucker	NM I
Washington, D.C. 20231			
Facsimile No.	. (703)305-3230	Telephone No. 703-308-0651	Ψ 1

Form PCT/ISA/210 (second sheet) (July 1998)